

Chico

"Dedicated to Public Service"

# THE RADIATOR

W6RHC  
IRLP #8170

www.gearsw6rhc.org

P.O.Box 202 Chico, CA 95927

January 2022 Newsletter

GEARS Founded August 13, 1939

Greetings from the President.....

Thank you for selecting me as your 2022 president. I am excited about the possibilities and the opportunity to be of service. Under the leadership of Jim Matthews, K6EST, a three consecutive year president, and the current officers and board, this past year has been very successful. Covid-19 has created many opportunities for imaginative thinking and adjustments. Although the club has had limited face-to-face activities during this year, it has grown and is very strong. Thank you to the current board and especially Jim for great leadership during these trying times.



The Holidays are past, I hope you and your families experienced a wonderful time during this season of celebration. This time of the year, including Thanksgiving, always puts me in a mentally grateful mode. Thankful for all the blessings my family and friends share. The concept of New Years Eve then New Years Day gives me a time for introspect and sort of starting anew. Ya, I'm still going to overeat and spend too much time in my chair, but I look forward to the opportunities the New Year will bring. I hope your Holidays were wonderful and the New Year brings you much joy.

'73

Paul Stewart N6PAS  
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 timely news and additional  
 information.

## January 2022 Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2 8pm OARS Net	3 7pm GARS Net 8pm ARES Net	4 7pm PARS Net 7:30pm GEARS Net	5	6 7:30pm Simplex Net	7	8 9am Chico Breakfast
9 8pm OARS Net	10 7pm GARS Net 8pm ARES Net	11 7pm PARS Net 7:30pm GEARS Net	12	13 7:30pm Simplex Net	14 7pm OARS meeting 7pm GARS meeting	15
16 8pm OARS Net	17 7pm GARS Net 8pm ARES Net	18 7pm PARS Net 7:30pm GEARS Net	19	20 7:30pm Simplex Net	21 7pm GEARS Meeting	22
23/30 8pm OARS Net	24/31 7pm GARS Net 8pm ARES Net					

**VEC Testing**, FCC License Exam available by appointment. For information or registration call Tom Rider, W6JS 530-514-9211

**Chico Breakfast** 2nd Saturday 9am Farmers Skillet Cohasset Rd, Chico

**GEARS** Board Meeting 1st Monday 7pm by zoom.

**PARS Meeting** 2nd Thursday 6:30pm, doors open 6pm Old Magalia Community Resource Center

**OARS Meeting** Second Friday of the month

**GARS Meeting** Second Friday of the month

**Butte ARES Meeting** 3rd Tuesday, TBD Contact Dale Anderson, KK6EVX 826-3461 for more information.

**GEARS Meeting**, 3rd Friday of the month, Eyeball QSO 6pm, meeting at 7:00 pm. Search & Rescue Building

**OARS Breakfast** 4th Saturday of the month

### NETS:

OARS Club Net Sunday 8pm 146.655 Mhz - PL 136.5

GARS Club Net Monday, 7:00 pm 147.105 MHz + PL 110.09, secondary: 146.850 MHz-PL 110.9

Butte ARES Net Mondays 8pm 145.290 MHz - PL 110.9

Yuba Sutter Club Net Monday 7pm 146.085 MHz + PL 127.3

GEARS Club Net Tuesdays 7:30 PM 146.850 MHz - PL 110.9

PARS Club Net Tuesday 7pm 145.290 - PL 110.9

Simplex Net Thursday 7:30 p.m. 146.52 no tone

Yuba Sutter ARES Net Thursdays 7pm 146.085 MHz + PL 127.3

Sacramento Valley Traffic Net Nightly 9:00 PM 146.850 MHz - PL 110.9

## GEARS Century Members

Dale Anderson, Kathy & Michael Favor

Kent Hastings, Bennett Laskey

*We thank these members for their extra support.*

# W5GI Mystery Antenna

A multi-band wire antenna that performs exceptionally well even though it confounds antenna modeling software.

Article by W5GI ( SK )

The design of the Mystery antenna was inspired by an article written by James E. Taylor, W2OZH, in which he described a low profile collinear coaxial array. This antenna covers 80 to 6 meters with low feed point impedance and will work with most radios, with or without an antenna tuner. It is approximately 100 feet long, can handle the legal limit, and is easy and inexpensive to build. It's similar to a G5RV but a much better performer especially on 20 meters.

The W5GI Mystery antenna, erected at various heights and configurations, is currently being used by thousands of amateurs throughout the world. Feedback from users indicates that the antenna has met or exceeded all performance criteria. The "mystery" part of the antenna comes from the fact that

it is difficult, if not impossible, to model and explain why the antenna works as well as it does. The antenna is especially well suited to hams who are unable to erect towers and rotating arrays. All that's needed is two vertical supports (trees work well) about 130 feet apart to permit installation of wire antennas at about 25 feet above ground.

The W5GI Multi-band Mystery Antenna is a fundamentally a collinear antenna comprising three half waves in-phase on 20 meters with a half-wave 20 meter line transformer. It may sound and look like a G5RV but it is a substantially different antenna on 20 meters. Louis Varney's antenna, although three half waves long, was an out-of-phase aerial. Mr. Varney had two specific reasons for selecting a 3 half waves on 20... he wanted a four-lobe radiation pattern, at least unity gain and a low feed point impedance. The Mystery antenna, on the other hand, presents a six-lobe pattern on 20 meters, gain broadside to the antenna, and also low feed point impedance to simplify matching the antenna to the rig. Additionally, the Mystery antenna is designed to work at least as well, on the other HF bands as a G5RV. In short, the Mystery antenna is a sky wire that incorporates the advantages of a 3 element collinear and the G5RV antenna.

In its standard configuration, a collinear antenna uses phase reversing stubs added at the ends of a center fed dipole. These stubs put the instantaneous RF current in the end elements in phase with that in the center element. You can make these phase reversing stubs from open wire line or coaxial cable. Normally, a shorted quarter-wave stub is used, but an open-ended half wave stub would also work. The problem is that the dangling stubs are unwieldy and or unsightly.

## Builders of the Mystery antenna will need the following materials:

3 wish bone insulators

About 70 feet of wire (14 gauge household electrical wire works well,)

Sufficient twin lead or open wire to make a half wave section on 20 meters. Window-type 18 gauge 300 ohm ribbon works best. The Wireman is an excellent source for antenna wire and 300 ohm line.

34 feet of RG8X mini-coax

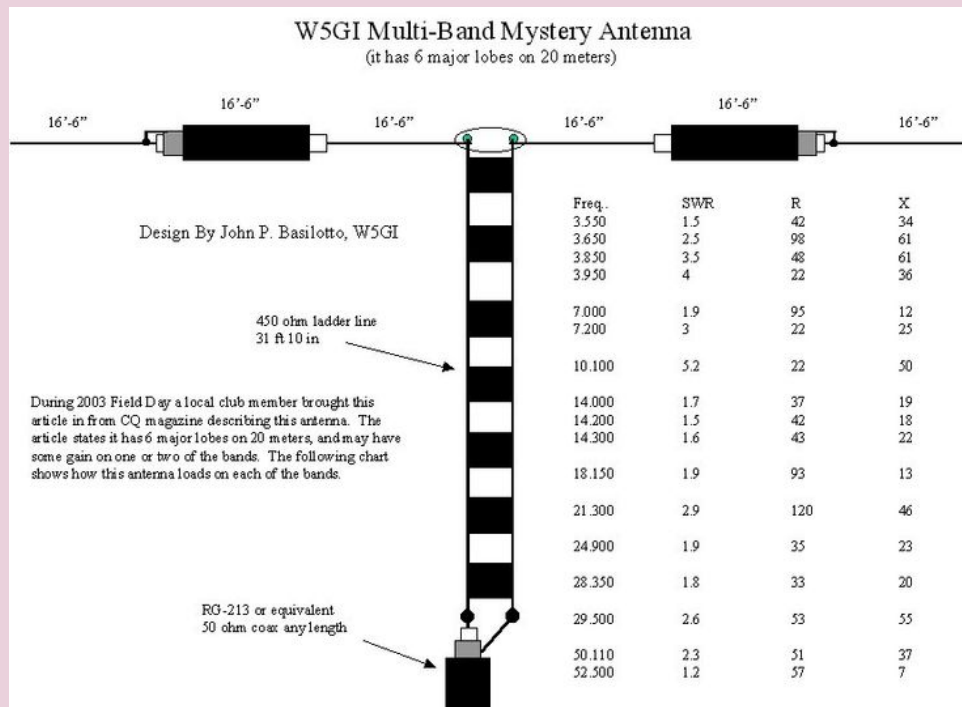
An electrical connector, available from most electrical parts stores, to connect the twin lead and coax

Shrink tubing to cover the exposed coax joints

The antenna can be built in less than an hour when you have the above materials. When you're ready to proceed, perform the following steps:

Cut the electrical wire into four equal lengths of 17 feet. Cut the two lengths of coax to 16'6 each.

Cut a 20 meter half-wave section of twin lead. This piece needs to be adjusted by its velocity factor. If 300 ohm window type line is used with a VF of .91, the total length will be 30 ft. Alternatively, 450 ohm, solid 300 ohm or homemade open-wire line can be used provided the electrical length is on-half wave on 20 meters. Actual length will vary, typically between 27 and 35



ft., depending on type and velocity factor. Trim two inches of braid from one end of both lengths of coax.

Trim one inch of braid and center insulator from the opposite end of both coax sections.

Build a 20-meter dipole without end insulators. Note: The next two steps 7 and 8 of the construction process involve connecting only the "inner" end section of the coax section to one end of the dipole; the shield is not connected to anything here. At the other end of the coax section both the coax shield and second wire section are connected to the coax center conductor. Connect one end of the dipole to the center conductor of the coax and cover with shrink tubing as shown in photo B below. Connect the opposite end of the coax (to braid AND quarter wave wire section, cover with shrink tubing, and connect to end insulator. Install the twin lead through the holes of the center insulator (you may have to enlarge the holes) and solder to antenna wire. Connect the opposite side of the twin lead to the coax as shown in photo E below. Almost any type of connection will work provided the connection is stable and sealed properly.

Install the antenna with the center conductor at least 25 feet high in a horizontal plane; however, others have installed this antenna as an inverted-vee and are getting excellent results

### On-the-Air Performance

On 20 meters, you should expect 3-6 dB gain over a dipole and a 6-lobe radiation pattern with an elongated figure 8 pattern perpendicular to the plane of the antenna. This is typical of a 3 element collinear array. For a simple explanation of collinear arrays read "Troubleshooting Antennas and Feed lines" by Ralph Tyrrell, W1TF. On all other bands the antenna performs like a G5RV, which is really a random length dipole on all but 20 meters. M. Walter Maxwell, in "Reflections II, Transmission Lines and Antennas", aptly describes this phenomenon. Several users report it is possible to use the antenna on 160 meters but you will need to connect the twin lead together at the point where it connects to the coax. On 160, the antenna performs like a Marconi. Those who have used the antenna on 160 say the W5GI Mystery antenna is a quieter receiving aerial compared to other 160-meter antennas.

As for the theory of operation, it remains a mystery. At least three experts tried computer modeling the antenna. All three rendered completely different findings.

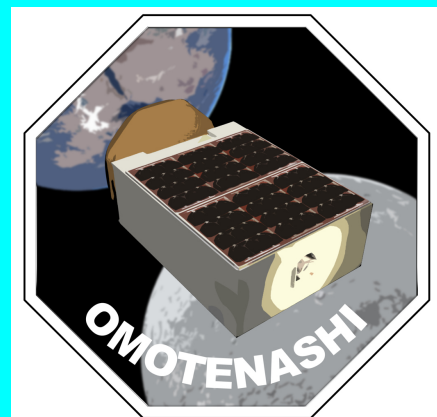
You will enjoy building a W5GI Multi-band Mystery Antenna! Many hams have done so and find it to have been a fun project and an excellent performer.

## World's Smallest Moon Lander from Japan will Put Ham Radio Transmitter on the Moon

From ARRL

Japan's OMOTENASHI, the world's smallest moon lander, will have an X-band and UHF communication system, although it will not carry an amateur band transponder. OMOTENASHI is a 6U CubeSat set for launch via a NASA SLS rocket as early as February 2022. It will have a mission period of from 4 to 5 days. The name is an acronym for Outstanding Moon Exploration Technologies demonstrated by Nano Semi-Hard Impactor. Wataru Torii of the Japan Aerospace Exploration Agency (JAXA) Ham Radio Club, JQ1ZVI, said radio amateurs can play a role in gathering data from the spacecraft.

The spacecraft is made up of two separable components, both having independent communication systems — an orbiting module and a surface probe. The orbiting module will take the surface probe to the moon. It will transmit beacon or digital telemetry data on UHF (437.31 MHz). The surface probe — the moon lander — will transmit digital telemetry or three-axis acceleration analog-wave with FM modulation on UHF (437.41 MHz). Transmitter power will be 1 W in both cases.



"If we succeed in receiving the UHF signal from the surface probe, we could know the acceleration data on the impact on the moon and the success of the landing sequence," Torii explained.

"We already have a station for uplink and downlink at Wakayama in Japan — used as an EME [moonbounce] station. However, if the satellite is invisible from Japan, we cannot receive the downlink signal. So, we need a lot of help from ham radio stations worldwide." Torii noted that the RF system on the lander only operates on UHF.

The orbiting module beacon will transmit on 437.31 MHz using PSK31. The surface probe beacon will transmit on 437.41 MHz using FM, PSK31, and PCM-PSK/PM.



## ISS Slow Scan TV Images Received Around The World

From December 26th and December 31st the International Space Station (ISS) has been transmitting slow scan images in the PD 120 format on 145.800 MHz.

There were twelve images, all with the theme of Lunar Exploration.

Operators around the world have been receiving images, some using very simple equipment. With a small outdoor ground plane antenna the signals can easily be received. They can be decoded using an Android app such as Robot36 by just holding the Android phone next to the receiver speaker.

The attached images were received by Woddy Hartlove K04UMQ in Baxter Kentucky.



### GEARS Officers:

President.....Paul Stewart, N6PAS  
Vice-President.....Kent Hastings, WA6ZFY  
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